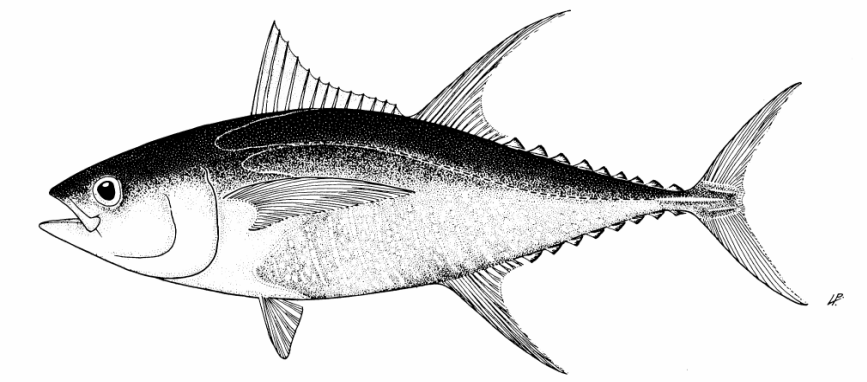
1st Meeting of the Scientific Committee of the
Western and Central Pacific Fisheries Commission
WCPFC–SC1
Noumea, New Caledonia
8–19 August 2005

A Summary of the Korean Tuna Fishery Observer Program for the Pacific Ocean (2004-2005)



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Korea began to develop its observer program for distant-water fisheries including tuna fisheries in 2002. The purpose of this program is to meet the requirements of relevant regional fisheries bodies such as the WCPFC and therefore the mission of trained observers are similar to those set out in the convention of the fisheries bodies. Before the official observer program was launched, Korea had irregularly dispatched NFRDI scientists aboard commercial tuna vessels to monitor fisheries and collect reliable catch statistics including biological samples, which were unobtainable by the regular data collection system. During the past 10 years, a total of 8 scientific observations were conducted for tuna fisheries operating in the Western and Central Pacific where the majority of Korean tuna purse seiners and longliners were active.

In 2004, a total of 5 observers were trained and educated, of which 3 observers were deployed for the first time to monitor tuna fisheries in the Pacific and Indian Oceans. Results of the two observer trips conducted in the Pacific from 2004 to early 2005 were summarized.

Purse seine fishery

The Western and Central Pacific Ocean (WCPO) serves as a usual fishing ground for the Korean tuna purse seine fishery since the early 1980s. To monitor this fishery, one trained observer was placed aboard Korean tuna purse seine vessels (1,300 GRT) targeting skipjack and yellowfin tuna during August 18-September 25, 2004.

The purse seiners were equipped with radars, color video and scanning fish founders, doppler sonar current meter, net depth recorder and so on and were operating auxiliary boats consisting of a skipper boat, net boat and one speed boat. To locate tuna schools, Korean tuna purse seiners usually carry helicopters. The purse seine net used by the monitored Korean purse seiners was about 2,410 m in length and 300-335 m in depth.

During the 39 days of the observation period, a total of 31 purse seine sets were monitored in the waters off the northeast Papua New Guinea, between 4°22'N-1°43'S and 148°12'-160°23'E (Fig. 1).

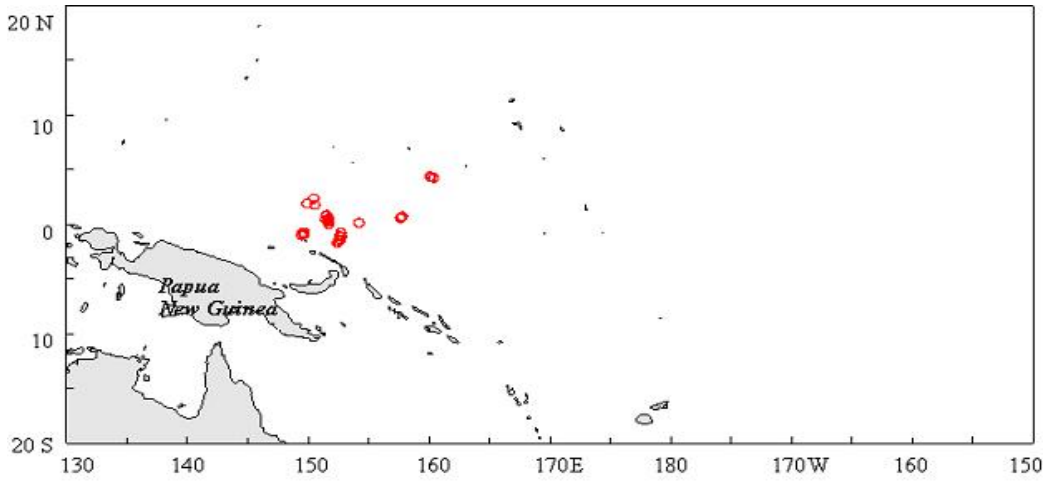

Fig. 1. Purse seine observation points

The sets consisted of 22 free-swimming school sets and 9 log-associated school sets including artificial logs (Table 1). The success rate of operating sets with 5.0mt or more of tuna catch were 41% for free-swimming school sets and 100% for log-associated school sets. Total observed catches were 1,115mt for target species and 12mt for bycatch species. Catch composition for target species averaged 68% for skipjack and 32% for yellowfin. Catch per unit effort (CPUE, mt/set) of this fishery was 36.4 mt/set on average and CPUE of log-associated school sets was much higher than that of free-swimming school sets. Catches taken from artificial log-associated school ranged from 11 to 121mt whereas that from free-swimming school ranged from 10 to 240mt.

Bycatch were observed in all log-associated school and 1 free-swimming school sets. However, it was not possible for us to list all bycatch species to the species level due to the lack of data from the observer. One billfish, 15 sharks and some miscellaneous fish species (i.e. file fish, rainbow runner, etc.) were recorded. In addition, one olive ridley sea turtle was caught aboard and released alive.

Length frequency data of skipjack and yellowfin tuna was also collected by the observer. A total of 193 skipjack and 30 yellowfin tuna were measured onboard (Fig. 2). As the continuation of a small voluntary tagging program by NFRDI, the observer

in cooperation with fishermen placed tags on 18 yellowfin, 1 bigeye and 5 skipjack and released them.

Table 1. Catch (mt) and CPUE (mt/set) by school types of the Korean tuna purse seine fishery during the scientific observation in 2004

school types	No. of set	Success rate (%)	skipjack tuna		yellowfin tuna		Subtotal (skj+yft)		Total	
			catch	CPUE	catch	CPUE	Catch	CPUE	catch	CPUE
Free-swimming school	22	41%	315	14.32	240	10.91	555	25.23	556	25.27
Log-associated school	9	100%	445	49.44	115	12.78	560	62.22	571	63.44
total	31	58%	760	24.5	355	11.5	1,115	36.0	1,127	36.4

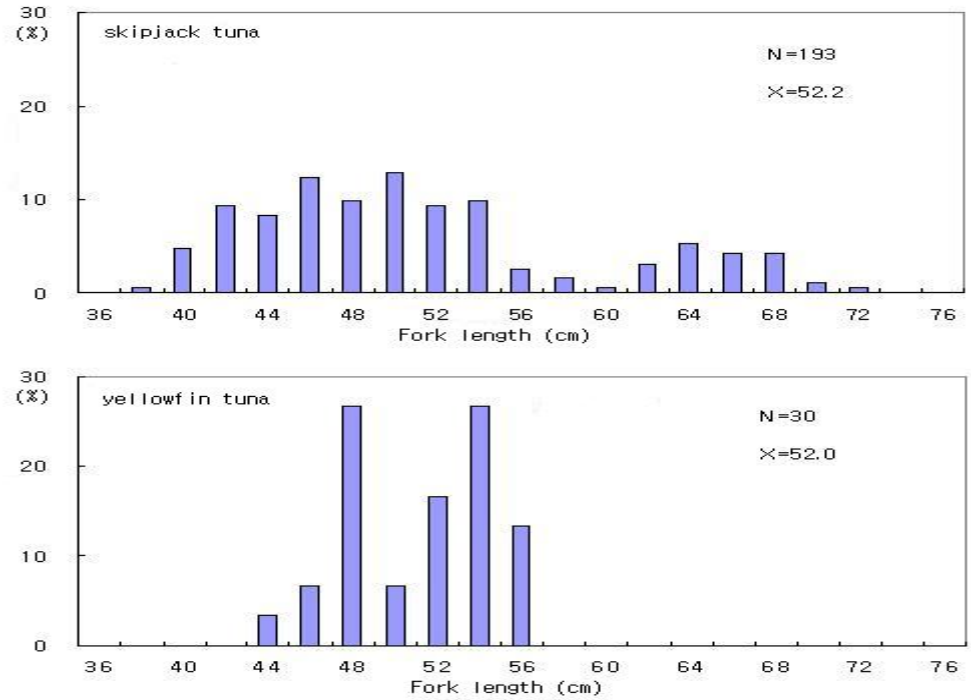

Fig. 2. Length frequency distributions of skipjack (top) and yellowfin (bottom) tunas.

Longline fishery

To monitor the Korean tuna longline fishery operated in the Pacific, one trained observer was deployed to a Korean longliner (450 GRT) fishing in the Eastern Pacific, between 5°42’ -11°23’S and 123°39’-146°43’W (Fig. 3).

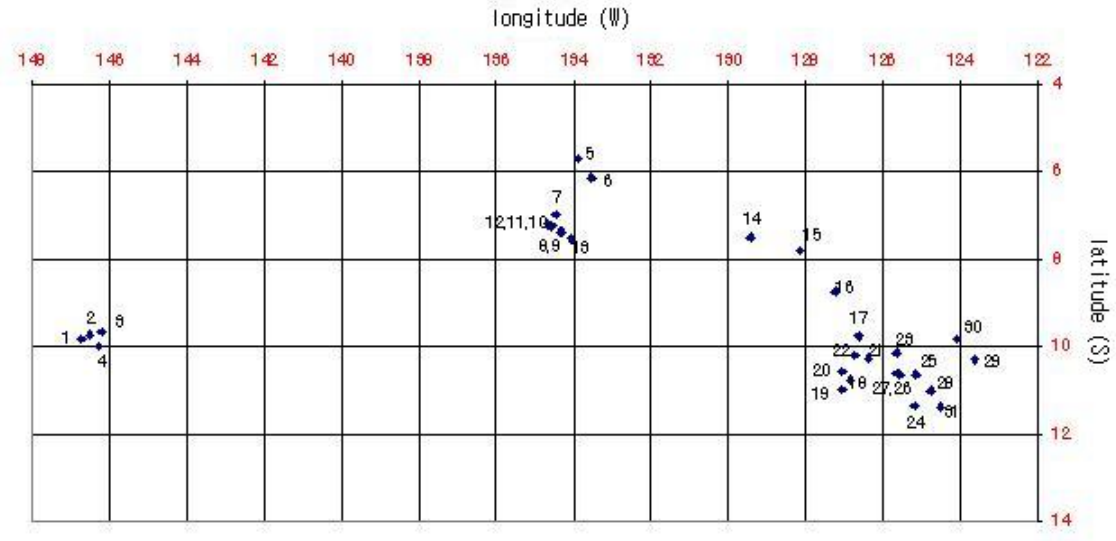

Fig. 3. Longline observation points in the Eastern Pacific.

During the 37 days of the observation period from December 10, 2004 to January 15, 2005, a total of 31 longline sets (one set per day) were monitored. The average number of baskets used for each set was 147 and hooks used ranged from 2,210 to 2,703 (average 2,492 hooks). Longline setting began at around 8:00am in the morning and finished by 2:00pm and after about 4 hours of soaking, the longline sets were hauled until the following morning. Among the 77,265 hooks used, 51,533 hooks (66.7%) were those observed by the on-board observer.

Catches sampled by the observer were 21.1 mt of tuna and billfishes, of which bigeye was the dominant tuna species accounting for 56.9% of the total catch in weight, followed by yellowfin at 1.9mt (9.0%), and albacore at 0.9mt (4.4%) (Table 2). Billfishes incidentally caught were striped marlin (31.6%), swordfish (6.7%), shortbill spearfish (2.5%), blue marlin (2.4%) and sailfish (0.5%). The total billfish catch corresponded to about 60% of the catch of target species.

A total of 21 bycatch species (356 in number) were observed during the trip, among

which billfishes and sharks were most common and some other fish species were also observed (Table 3). To prevent the incidental catch of seabirds, the vessel was implementing several measures, recommended by various international societies, such as the use of thawed bait, bait casting machine and weighted branch line. Nevertheless, one albatross was incidentally caught during the line was setting.

Length frequency data for the sampled tuna and billfishes were collected. The fork length of bigeye tuna ranged from 75cm to 190cm (mean 120cm) and that of yellowfin represented a similar range but with a mean length (127cm) slightly bigger than bigeye. Albacore was generally smaller than the two species, ranging from 75cm to 110cm (mean 94cm).

Table 2. Catch and CPUE of tunas and billfishes

Species	Catch				CPUE	
	No. of fish	%	Weight (kg)	%	fish/100hooks	weight/100hooks
Yellowfin	59	10.8	1,897	9	0.11	3.7
Bigeye	317	58.3	12,023	56.9	0.62	23.3
Albacore	51	9.4	924	4.4	0.1	1.8
Skipjack	5	0.9	52	0.2	0.01	0.1
Blue marlin	9	1.7	505	2.4	0.02	1
Striped marlin	51	9.4	6,675	31.6	0.1	13
Sailfish	4	0.7	104	0.5	0.01	0.2
Swordfish	31	5.7	1,409	6.7	0.06	2.7
Shortbill spearfish	17	3.1	530	2.5	0.03	1
Total	544	100	21,119	100	1.06	41

Table 3. List of bycatch species (billfish not included)

Species	No. of fish	%
Blue shark	33	13.5
Smooth Hammarhead Shark	4	1.6
Mako shark	1	0.4
Salmon Shark	43	17.6
Pelagic thresher shark	3	1.2
Bigeye thresher shark	9	3.7
Opah	3	1.2
Escolar	34	13.9
Oilfish	17	7
ocean sunfish	2	0.8
Dolphin fish	7	2.9
Great Barracuda	1	0.4
Wahoo	34	13.9
Pomfrets (Angelfishes)	40	16.4
Longnose Lancetfish	2	0.8
Pelagic stingray	11	4.5
Total	244	100

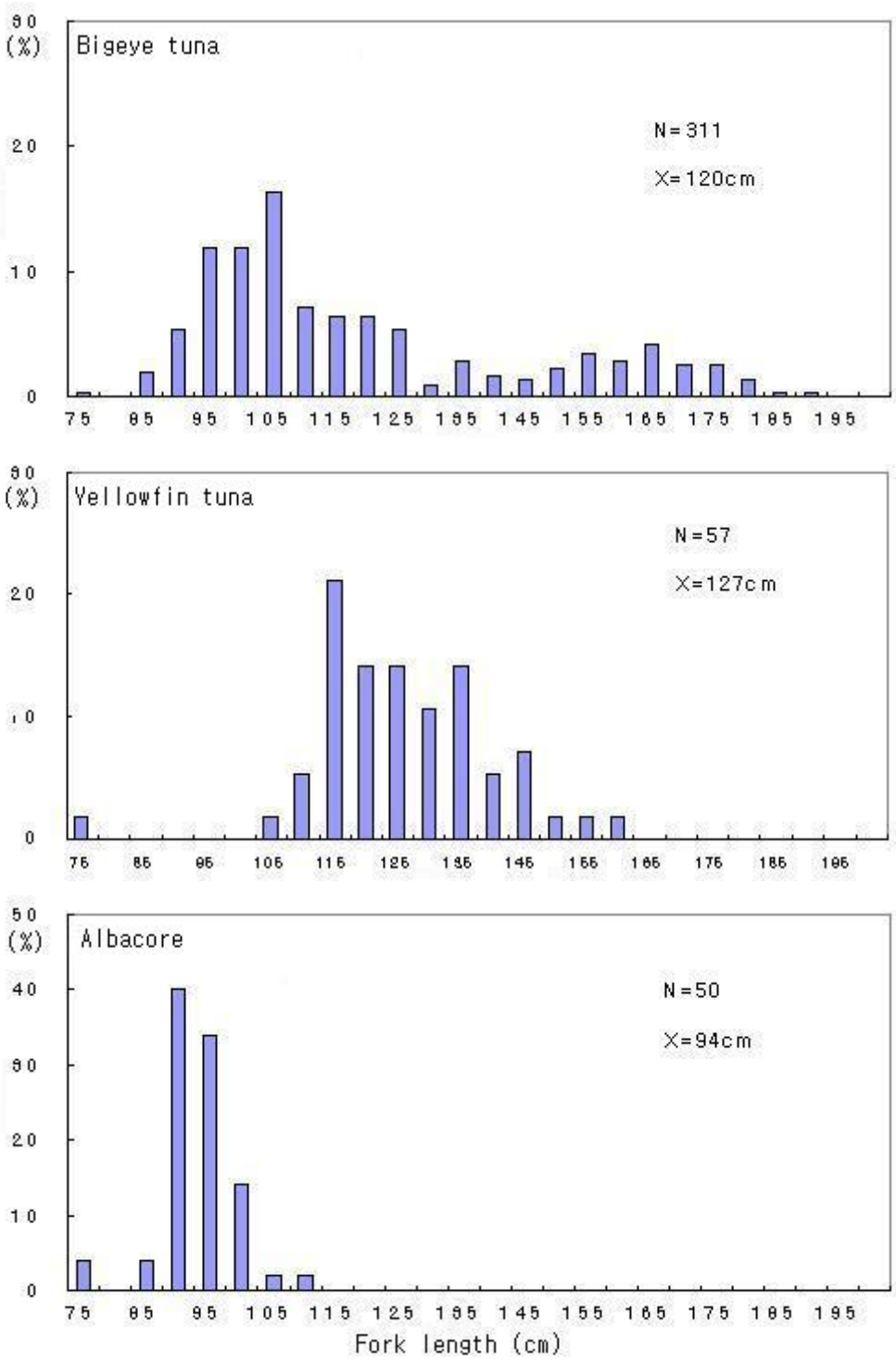

Fig. 4. Fork length frequencies of tunas.

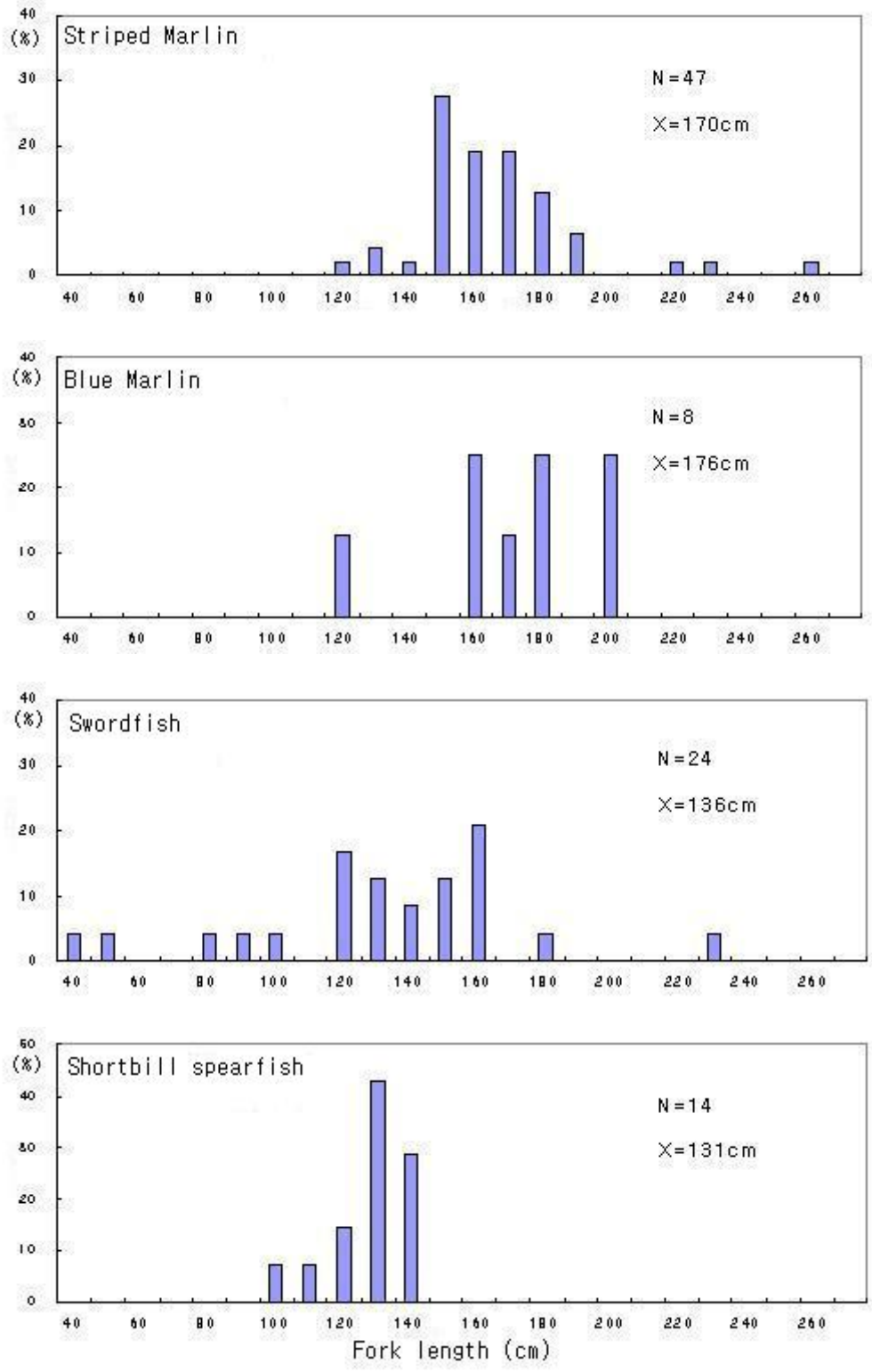

Fig. 5. Fork length frequencies of billfishes